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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/033,222	03/02/1998	TADD H. HOGG	D/98093	1837

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EXAMINER	
SHAPIRO, JEFFERY A	
ART UNIT	**PAPER NUMBER**
3651	

DATE MAILED: 12/10/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/033,222	HOGG ET AL.	
	Examiner	Art Unit	
	Jeffrey A. Shapiro	3651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al (IEEE publication by Satoshi Konishi and Hiroyuki Fujita, entitled *"A conveyance System Using Air Flow Based on the Concept of Distributed Micro Motion Systems"*, June 1994, IEEE, Journal of Microelectromechanical Systems, Vol. 3., No.2.) in view of Harada et al. Fujita et al discloses the transport assembly as follows.

As described in Claims 1, 7, 8 and 15;

1. sensor units and actuator units arranged on the transport assembly;
2. said sensor units for providing positional information of the object;
3. said actuator units (see "logic circuit" in figure 1) for moving the object relative to the transport assembly (see figure 2);

As described in Claim 8;

3. said actuator units are spatially proximate to each other and ones of said sensor units (see figure 1);

Fujita et al notes in the Abstract, at lines 3-7, that distributed coordination and control of said individual sensor units and actuator units is desired. Fujita et al notes under *Introduction*, first paragraph, that coordination of multiple "smart modules", each having at least an actuator, a sensor and logic circuit.

Harada et al discloses the following.

As described in Claims 1, 7, 8 and 15;

4. local computational agents coupled to said sensor units and said actuator units (48) (See figure 2);

5. each of said computational agents accumulating sensor information from a spatially localizing grouping of sensor units (49) (See figure 2);

6. a global controller (1), coupled to said local computational agents, for receiving aggregate operating characteristics from, and delivering global constraints to, said local computational agents (see col. 3, lines 31-52);

7. said local computational agents using the global constraints and the sensor information to determine adjustments to said actuator units to move the object along the transport assembly (see col. 3, lines 52-61) (note that this control scheme is capable of use in a distributed array of smart modules which may be used to transport an object);

As described in Claim 7;

8. neighboring ones of said sensor units and said actuator units are coupled to computational agents that communicate directly with each other (see figure 1, noting also communication means (2) and (5) as well as dotted lines between subsystem (6a) and (6b), for example); (also note that Fujita et al discloses communication between adjacent smart modules);

As described in Method Claim 15;

9. computing a local actuator response for accumulated sensor information from a spatially localized grouping of sensors (see figures 1 and 2, noting in figure 1 subsystems (6a and 6b));

10. computing a global actuator (21 or 44) response for detected global constraints (45) from the global controller;

11. computing a desired actuator response for minimizing differences between the computed local actuator response and the computed global actuator response (22 or 42) ;

12. applying the desired actuator response to a spatially localized grouping of actuator units (see figure 1, noting the many subsystems (6a and 6b));

As described in Claims 2 and 20;

13. a lookup table for communicating the global constraints to said local computational agents (see figures 6-8) ;

As described in Claim 3;

14. a filter unit (42, 43 or 48) for computing the aggregate operating characteristics after receiving the sensor information from the local computational units (note figure 1, indicating that several subsystems may be linked to higher supervisory systems indicating in turn that the calculating subsystem (48), for example, could be repeated on each level

in a similar fashion to the lowest level subsystem—note also figure (23) which has element (23) for evaluating subgoal achievement performances as well as information interpreting subsystem (41) which could both be construed to contain algorithms for computing aggregate operating characteristics);

As described in Claim 4;

15. said global controller (1) receives the aggregate operating characteristics over a first operating interval (note that it is a matter of design choice as to how many operating intervals are sampled);

As described in Claim 5;

16. said global controller (24) delivers the global constraints over a second operating interval (note that this is a matter of design choice as to when to deliver the global constraint to the subsystem);

As described in Claim 6;

17. the second operating interval is longer than the first operating interval (note that the operating intervals are a function of design choice and would be adjusted to be able to accommodate the specific case);

As described in Claim 9;

18. said local computational agents compute a global response using the global constraints (see figure 2 noting (45));

As described in Claim 10;

19. said local computational agents compute a local response with the sensor information (see figure 2 noting (50));

As described in Claim 11;

20. said local computational agents determine adjustments to said actuator units with a desired actuator response computed using the global response and the local response (see figures 1-3);

As described in Claim 12;

21. said local computational agents rank the global response and the local response in importance using weights (see claim 5, col. 11, lines 33-36 and col. 12, lines 1-5 noting that costs are essentially weights);

As described in Claim 13;

22. said local computational agents adaptively determine values for the weights (note that the system is, at the very least, inherently adaptive based upon local responses and knowledge—see col. 1, lines 56-60);

As described in Claim 14;

23. said local computational agents and said global controller are organized hierarchically (see figure 1);

As described in Method Claim 16;

24. modifying the desired actuator response to compensate for malfunctioning actuators; (Note that it is inherent that the adaptive control

system of Harada et al is able to compensate for malfunctioning or missing actuators.)

As described in Method Claim 17;

25. said modifying step compares the desired actuator responses of computational agents coupled to spatially localized groupings of sensors and actuators (see figures 1-3);

As described in Method Claim 18;

26. said modifying step compares the local actuator response of computational agents coupled to spatially localized groupings of sensors and actuators (see figures 1-3);

As described in Method Claim 19;

27. determining whether spatially localized groupings of sensor and actuator units function properly (again, note that it is inherent that the adaptive control system of Harada et al is able to detect groups of sensors and actuators and determine their functional capabilities based on their output—see also figures 1-3 and col. 9, lines 51-63);

Both Fujita et al and Harada et al are analogous art because they concern distributed control and the solving of associated problems such as coordination of disparate subsystems. (See abstracts of Fujita et al and Harada et al. Note also Fujita, introduction, lines 9-19)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the distributive control system of Harada et al to control the microactuator arrays of Fujita et al.

The suggestion/motivation for doing so would have been to distributively control the microactuator arrays of Fujita. (See abstract of Fujita et al.)

Therefore, it would have been obvious to combine Fujita et al with Harada et al to obtain the invention as specified in Claims 1-20.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 1-20s are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U.S. Patent No. 6,119,052. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claim 1-20s are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U.S. Patent No. 6,039,316. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U.S. Patent No. 6,027,112. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-6 of U.S. Patent No. 5,634,636 in view of Fujita et al, described above. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Claims 1-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-6 of U.S. Patent No. 5,634,636 in view of Harada et al, described above. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wehrung et al, Brown (US 5,431,182), Kayama et al, Skeirik, Kohn et al, Lewis et al, Crater et al, Bakalash, Lennartsson, Duguay et al, Hawkins, Suzuki, Noriyuki (JP 410289255) and Maekawa et al (JP 406253374) are all cited as examples of distributed control systems.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey A. Shapiro whose telephone number is (703)308-3423. The examiner can normally be reached on 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher P. Ellis can be reached on (703)308-2560. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-0552 for regular communications and (703)308-0552 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1113.

Jeffrey A. Shapiro
Patent Examiner,
Art Unit 3651

December 6, 2001

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